TEACHING STAFF' ATTITUDE TOWARD ICT:
Is Gender A Factor?

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ABSTRACT

Current research seeks to understand weather gender is a factor that should be considered when considering teaching staff' attitude toward Information and Communication Technology (ICT). Survey methodology is facilitated through the use of the questionnaires. The survey domain is a random sampling of teaching staff in Egyptian higher education institutions (HEI). The population for this study was 500 full-time Faculty staff, only 412 returned and complete questionnaires are considered as the study sample. The results showed that no difference between being a male or a female as regard to the attitude toward ICT among teaching staff in Egyptians HEI; thus, gender is not a significant factor when considering attitude toward ICT by teaching staff members in Egyptians HEI. The result of this research has significant implications to HEI when they plan, develop, and adopt ICT; thus, HEI has to consider that teaching staff' attitude toward ICT is not related to their gender.

Keywords: ICT, Higher Education, Teaching Staff, Attitude toward ICT, gender.

INTRODUCTION

ICT has become an important part of the majority of organizations and businesses in order to maintain a competitive edge. Since ICT has to be accepted and used successfully by its intended users, research stream on investigating issues related to the attitude toward ICT has become one of the most creative, and also claimed to be one of the most mature research areas (Venkatesh, Morris, Davis, & Davis, 2003). Educational institutions should be highly computerized, and all teachers should be able to use the technology to enhance their working methods (Key Data on Information and Communication Technology in Schools in Europe, 2004).

ICT are the tools for change and innovation and its educational value was confirmed (Williams, 2003). Moreover, ICT are seen as important tools of advancement. One of the most critical issues in developing and maximizing the benefits of ICT in teaching and learning work is the level of confidence and acceptance of academic staff in using ICT to gain its benefits in their work. Milbrath and Kinzie (2000) indicated that in order to be effective users of ICT and be models for students' computer use, teaching staff must have positive computer attitudes and feels self-efficacious in using them.

In the modern era, ICT plays a crucial role in the way the societies functions. The future of the society's prosperity is strongly correlated with ICT integration in every aspect of life. Moreover, ICT offers possibilities for improving competitiveness among organizations; they provide tools and methods for getting access to new opportunities and specialized information services such as distance education, continuous training, new advisory and consultancy modes. Organizations that are able to exploit the potentials offered by ICT can handle innovative processes more effectively (Fulantelli & Allegra, 2003).

The literature contains evidence that there is a difference between males and females as regard to several issues. Technological progress aims at improving the standard of living of people. Yet not all people will in general benefit equally from that progress. It is

obvious that for women the enhancement of their life is not always visible. In many societies, because of traditional role patterns, there frequently are clear obstacles in a society which causes that both sexes do not benefit equally from the advantages of the technological progress in general.

Traditional social ways of thinking cause many of these barriers as females have a lower social position and fewer opportunities than males. Furthermore, females have a more share in reproductive and household tasks. As a consequence, females in general have less access to power, education and productive sources than males, and thus fewer options to cooperate productively in the society (McGregor & Bazi, 2001).

Sustainability of advancement greatly depends on the flexibility to adapt the existing social structure, and thus may be delayed by the strength of these barriers. In order to make developing work sustainable, re-examination of the existing societal structures therefore is of great importance. A fair representation of females is essential to guarantee the basic access to the new innovations (Primo, 2003).

Yu (2002) studied the need for ICT in developing countries and why gender issues play an essential role in this regard. He focused on the relationship between attitudes toward ICT in relation with gender. He concluded that gender-sensitive aspects play a central role. He declared that gender needs special attention in the context of the technological fast changes. The challenges are on the issue of creating an environment in which a harmonious and justified cooperation between both sexes is of great importance for a positive development in general and in particular on the area of ICT.

While the literature has a number of research studies supporting higher education faculty perception of adopting technology in general (Albright, 1996; Jacobsen, 1997; Straub, 2009; Sugar et al., 2004), a very limited research existed to highlight and focuses on the nature of the relationship between teaching staff' gender and their attitude toward ICT in Egypt; thus more research is warranted in this regard in order to highlight the effect of gender on teaching staff attitude toward ICT.

The research believes that the key to successful integration of ICT into education is teaching staff; thus investigating factors directly related to their attitude toward ICT is significantly important. This investigation and analysis aims to adding to the limited literature regarding the direct relationship between HEI teaching staff' gender and their attitude toward ICT.

The term 'gender' will be used according to the description of (McGregor & Bazi, 2001): "Whereas the sex of an individual is biologically determined, gender refers to the socially constructed definition of females and males and the relationship between them. Gender is culture-specific and also varies over time. It determines the conception of tasks, functions and roles attributed to women and men in society, in both public and private life".

RELATED RESEARCH

Adams (2002), in one of the studies that showed gender concerns, he studied full and part-time faculty members teaching at a HEI, he indicated that females display a greater integration average than do males. Adams concluded that younger female teachers with less teaching experience more readily integrate technology into teaching practices.

In the same context, Kumar et al. (2008) declared that it is important to investigate the factors that affect teaching staff use of ICT. In their research, they discovered that,

among other factors, gender have important effects of the actual use of ICT by teaching staff. This result is supported by a more recent research of Sang et al. (2009).

Brosnan (1998) concluded that males showed more positive attitudes toward ICT than females do. In the same context, Graff (2003) declared that females were less likely to use ICT and were less confident in using ICT than males do. Moreover, Palaigeorgiou et al. (2005) also confirmed that both males and females had similar engagement with ICT and held concerns for the future effects of continuous computer use, but females were more concerned, and judged less positively the consequences of ICT in personal and social life.

Papaioannou and Charalambous (2011) in their study explored the impact of gender on the attitudes toward ICT. The study found that both male and female hold positive attitudes toward ICT with males having stronger positive attitudes than their female colleagues. Also, Ainley and Enger (2007) discovered that regarding gender, males have more positive attitudes toward ICT.

Whitley's (1996) study concluded that both males and females hold positive attitudes toward ICT, but there is a small gender difference on negative attitudes for females being more anxious about the negative impact of computers on society.

Contradicting with previous studies, Warg et al. (2000) in their investigation for the possible differences between genders regarding attitude toward ICT, they did not find any significant differences. Moreover, Intaganok et al. (2008) concluded that gender was insignificant factor and did not affect attitude toward ICT and ICT competence. However, it worth mentioning that there are some recent research studies, which revealed that the gender gap between males and females is shrinking or does no longer exist (Bhattacharjee, 2008; Imhof, Vollmeyer, & Beierlein, 2007; Teo, 2008; Intaganok et al., 2008). From the previous illustrations, we can conclude that studies on attitude toward ICT have gone through ups and downs yielding conflicting and questionable findings on the relationship between attitude toward ICT and gender differences; thus requiring further focused investigations.

METHODOLOGY

Current research seeks to understand the relationship between teaching staff' gender and their attitude toward ICT. Survey methodology is facilitated through the use of the questionnaire technique, which was employed in this research.

Oscarson (1976) scale to measure adoption-proneness was used to aid in understanding this relationship. Adoption of the proneness scale measurement was used in this study after major modifications due to the conduct of a pilot study and instrument testing conducted by Elsaadani (2011) in order to ensure that the questions used reflect the intended meaning of the researcher and to ensure that this meaning will be understood by anyone reading these questions. So, the instrument is therefore valid. A follow-up pilot study was conducted in 2011 before the start of the spring semester with a sample of teaching staff. This pilot study sample comprised 25 Faculty staff, with a return rate of 80%. The responses from this pilot sample did not request any further modifications to the instrument. Analysis of quantitative data is processed with the aid of SPSS 19.0 program to produce research findings.

The survey domain is a random sampling of teaching staff in Egyptian HEI. The research is aware of the dangers of selection bias of the study participants, thus, a draw was made as a type of blind selection in order to ensure fairness in the selection among the full list of universities, faculties, and disciplines.

A table with a randomly selected teaching staff members was generated from each faculty's human resources department containing fifty of their teaching staff members to share in the study after taking the permission to do so from each university administration.

The population for this study was 500 full-time Faculty staff. The research used the total population as the survey target participants, and 414 participants responded, but only 412 are complete and usable questionnaires, and are considered as the study sample. Selection criteria for study participants were based on teaching staff members who teach courses during the spring semester of 2011.

Resulting data were analyzed using test of normality of questionnaire data (PP plot), reliability test (Cronbach alpha), validity test (principal component factor analysis), descriptive analysis, one-way analysis of variance (ANOVA), Pearson correlation, and regression analysis. Independent samples t test was conducted in order to confirm the result.

Descriptive analysis is employed in order to determine the frequencies of the variables. Both Cronbach alpha and principal component factor analysis are used with both the piloted and the final version of the instrument in order to ensure that the instrument is reliable and valid.

One-way ANOVA is employed in order to determine whether several sets of scores have different means or not, and to determine the relationships among variables. Correlation is used with piloted data in order to ensure both criterion and construct validity.

Unvaried analysis of variance is employed in order to see whether changes in the independent variable have significant effect on the dependent variable or not, but the degree of that change is determined using regression analysis. Cronbach alpha is used with both the piloted and the final version of the instrument in order to ensure that the instrument is reliable.

Test on normality is conducted at the beginning in order to determine whether random variables are normally distributed or not, since this enhances the application of statistical tests applicable to normal distribution variables. The probability level for all tests of statistical significance for the study will be set at $p < 0.05$.

RESULTS

This research focuses only on the relationship between gender and attitude toward ICT, rest of questionnaire analysis reported elsewhere. Test on normality is conducted at the beginning, and it was determined that the used variables are normally distributed; thus it is acceptable to use the statistical tests applicable to normal distribution variables.

Gender of the participating members was male participants representing 64%, while female participants representing 36%.

Reliability Case Processing for 412 participants using Cronbach's Alpha for attitude toward ICT (19 items) scored 0.840, use of ICT in teaching (21 items) scored 0.828, judgment about ICT use (six items) scored 0.783, professional development of Faculty staff (six items) scored 0.701, ICT support services (six items) scored 0.783, and barriers to adopting and using ICT (29 items) scored 0.862. While Cronbach's Alpha reliability for the entire instrument scored 0.771. Thus, reliability was proved for the used survey instrument and its internal consistency is acceptable.

Principal component factor analysis was used to assess convergent and discriminant validity. Most loading within variable were greater than 0.80, while most loading across variables were less than 0.30, indicating good convergent and discriminant validity.

Resulting data were analyzed using test of normality of questionnaire data (PP plot), reliability test (Cronbach alpha), validity test (principal component factor analysis), descriptive analysis, one-way analysis of variance (ANOVA), Pearson correlation, and regression analysis. Independent samples *t* test was conducted in order to confirm the result. Findings revealed that gender is not a factor when considering attitude toward ICT.

Four hundred and twelve higher education teaching staff members (64.1% male and 35.9% females; with mean=1.36 years, SD=0.480) were investigated. The mean attitude toward ICT scored 85.26 showing that respondents have positive attitudes toward ICT as shown in tables 1 and 2.

Table: 1
Gender Frequencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	264	64.1	64.1	64.1
	Female	148	35.9	35.9	100.0
	Total	412	100.0	100.0	

Table: 2
Attitude toward ICT & Gender Descriptive Statistics

	N	Mean	Std. Deviation
Attitude toward ICT	412	85.26	11.466
What is your gender?	412	1.36	0.480
Valid N (listwise)	412		

Analysis done using One-way Analysis of Variance showed insignificant difference between gender and the attitude toward ICT (F (1, 410)=0.809, P= 0.369) as shown in table 3.

Table: 3
Analysis of Variance (Gender & Attitude toward ICT)

ANOVA

Attitude toward ICT

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	106.370	1	106.370	0.809	0.369
Within Groups	53926.841	410	131.529		
Total	54033.211	411			

Tests of Between-Subjects Effects

Dependent Variable: Attitude toward ICT

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	106.370[a]	1	106.370	.809	.369
Intercept	2994917.789	1	2994917.789	22770.039	.000
Gender	106.370	1	106.370	.809	.369
Error	53926.841	410	131.529		
Total	3048951.000	412			

ANOVA

Attitude toward ICT

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	106.370	1	106.370	0.809	0.369
Within Groups	53926.841	410	131.529		
Corrected Total	54033.211	411			

a. R Squared=.002 (Adjusted R Squared=.000)

Pearson correlation among gender and attitude toward ICT is negative and insignificant (r=- 0.044, p=0.369) as shown in table 4, which support the concluded achieved result that there is no relationship between gender and attitude toward ICT. Regression factor (R=0.044) is minor, while the determinant factor (R Square=0.002), which is the percentage of change in the attitude toward ICT that is explained by gender (see table 5).

Table: 4
Pearson Correlation Matrix (Gender & Attitude toward ICT)
Correlations

		What is your gender?	Attitude toward ICT
What is your gender?	Pearson Correlation	1	-.044
	Sig. (2-tailed)		.369
	N	412	412
Attitude toward ICT	Pearson Correlation	-.044	1
	Sig. (2-tailed)	.369	
	N	412	412

Table: 5
Regression Analysis (Gender & Attitude toward ICT)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.044[a]	.002	.000	11.469

a. Predictors: (Constant), What is your gender?

CONCLUSION

New innovative educational technologies are now replacing traditional educational means. These new innovations are doing much more than simply delivering regular lectures. Although, today HEI are increasingly using ICT as a means to improve teaching and learning, the current study adds to the limited literature on the nature of the relationship between teaching staff' gender and their attitude toward ICT in HEI within the Egyptian context. The main strength of the current study is that it provides up-to-date information about this relationship and communicates this information to the administration of HEI in Egypt.

The results showed that there is no significant difference exists between the gender of participants and their attitude toward ICT; thus indicating no relationship between both of them. Independent samples t test was conducted in order to confirm the result. Mean of males is slightly higher than females, but the observed t is not significant; thus indicating no difference between males and females as regard to their attitude toward ICT (see tables 6 & 7).

Table 6
Gender & Attitude toward ICT Group Statistics

	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
Attitude toward ICT	Male	264	85.64	11.379	.700
	Female	148	84.58	11.627	.956

Table: 7
Independent Samples Test (Gender & Attitude toward ICT)

					t-test for Equality of Means			95% Confidence Interval of the Difference	
	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference		Lower	Upper
Attitude toward ICT	.826 .049	.899 .894	410 299.060	.369 .372	1.059 1.059	1.178 1.185		1.256 1.273	3.374 3.391

Regression factor determined to be minor, and the determinant factor (R Square) showed the percentage of change in the attitude toward ICT that is explained by gender differences. This study concluded that in considering attitude toward ICT by teaching staff members in Egyptians HEI, gender is not a significant factor.

The concluding results of the study indicating that there is no relationship between teaching staff gender and their attitude toward ICT. This same conclusion has been approved by many other previous studies (Warg et al., 2000; Intaganok et al., 2008; Bhattacharjee, 2008; Imhof et al., 2007; Teo, 2008; Intaganok et al., 2008).

The study found that both male and female hold positive attitudes toward ICT as no difference between box sexes.

This result could seem strange since a common idea is shared in almost all societies that males are using ICT more than females are. The result of this research has significant implications to HEI when they plan, develop, and adopt ICT. HEI has to consider that the teaching staff attitude toward ICT is not related to their gender.

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